

WHAT IS CLAIMED IS:

1. A rechargeable lithium ion battery comprising a cathode electrode, an anode electrode, an electrolyte and a separator, wherein at least one of said cathode electrode and anode electrode comprises an additive of from about 0.1 to about 50 % wt. of electrode active materials, said additive comprising a metal fiber prepared from one or more materials selected from the group consisting of iron, nickel, copper, zinc, titanium, aluminum, silver, gold, platinum, iron-chromium alloy, iron-chromium-nickel alloy, and aluminum alloy, said fiber having a diameter from about 0.1 to about 25 microns and an aspect ratio of from about 4 to about 2500.

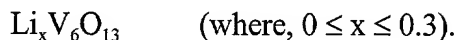
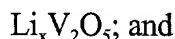
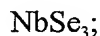
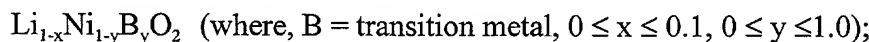
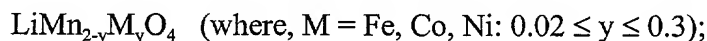
2. The battery according to Claim 1, wherein said cathode electrode comprises a material, as an active compound, selected from the group consisting of a compound capable of reacting reversibly with a lithium ion, a compound having a structure in which a lithium ion can be intercalated, an organic sulfur compound, and a polymeric organic sulfur compound.

3. The battery according to Claim 2, wherein said active compound comprises one or more active materials selected from the group consisting of:



(where, A = alkaline metal or alkaline earth metal,

B = transition metal, $0 \leq x \leq 0.1$, $0 \leq y \leq 1.0$);



4. The battery according to Claim 1, wherein said anode electrode comprises a material, as an active compound, selected from the group consisting of a compound capable of reacting reversibly with a lithium ion, a compound having a structure in which a lithium ion can be intercalated, lithium metal, lithium alloy, and carbon.

5. The battery according to Claim 1, wherein said additive comprises a metal fiber prepared from one or more materials selected from the group consisting of aluminum-copper, aluminum-manganese, aluminum-magnesium, and aluminum-silicon-magnesium.

6. The battery according to Claim 1, wherein said electrolyte comprises a lithium salt selected from the group consisting of LiPF_6 , LiBF_4 , LiClO_4 , LiClO_4 , LiAsF_6 , LiSbF_6 , $\text{LiN}(\text{CF}_3\text{SO}_2)_2$, LiCF_3SO_2 , and $\text{LiN}(\text{SO}_2\text{C}_2\text{F}_5)_5$.

7. The battery according to Claim 1, wherein said electrolyte comprises a solvent selected from the group consisting of ethylene carbonate, propylene carbonate, vinylene carbonate, dimethyl carbonate, butylene carbonate, γ -butyrolactone, diethyl carbonate, ethylmethyl carbonate, N,N-dimethyl acetamide, dimethoxyethane, and mixtures thereof.

8. The battery according to Claim 1, wherein said separator is a microporous polymeric membrane or nonfabric.

9. The battery according to Claim 1, wherein said metal fiber has a diameter from about 0.5 microns to about 4 microns, and an aspect ratio of from about 4 to about 2500.

10. The battery according to Claim 1, wherein said additive is a mixture of two or more metal fibers different in size.

11. The battery according to Claim 1, wherein a content of said additive is from about 0.1% to about 10% by weight of electrode active materials.

12. A method of manufacturing a rechargeable lithium ion battery comprising the steps of:

- a) preparing a suspension by adding an additive of about 0.1% to about 50% by weight to electrode active materials, said additive comprising a metal fiber prepared from one or more materials selected from the group consisting of iron, nickel, copper, zinc, titanium, aluminum, silver, gold, platinum, iron-chromium alloy, iron-chromium-nickel alloy, and aluminum alloy, said fiber having a diameter from about 0.5 to about 25 microns and an aspect ratio of from about 4 to about 2500;
- b) applying the suspension to a collector; and
- c) heating the collector obtained in step b).